NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA

THESIS

IMPACT ON WORKLOAD AT THE NAVAL POSTGRADUATE SCHOOL DUE TO THE IMPLEMENTATION OF CREDIT CARDS

by

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December 1995

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REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	December 1995	Master's Thesis

4. TITLE AND SUBTITLE	5. FUNDING NUMBERS
IMPACT ON WORKLOAD AT THE NAVAL POSTGRADUATE SCHOOL DUE TO THE IMPLEMENTATION OF CREDIT CARDS	
6. AUTHOR(S) Hleba, Theodore A.	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey CA 93943-5000	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION/AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE
Approved for public release; distribution is unlimited.	

13. ABSTRACT *(maximum 200 words)*

The purpose of this thesis is to determine the impact on workload redistribution resulting from the use of government credit cards at the Naval Postgraduate School (NPS). Because workload requirements, particularly the Supply Department's, may have been redistributed across other departments at NPS, these will be identified and measured. Primary data on procurement cases was collected from the Comptroller's Department and the procurement branch of the Supply Department. Pre-credit card procedures (purchase orders, BPAs and the Imprest Fund) and related purchase action volume were identified and measured, as well as government credit card procurement procedures and related purchase action volume. The intent is to identify any workload requirements, such as technical screening, procurement and material receipt, which may have been redistributed as a result of using government credit cards.

14. SUBJECT TERMS CREDIT CARDS, WORKLOAD IMPACT, MICRO PURCHASE	15. NUMBER OF PAGES 66
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18 298-102

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IMPACT ON WORKLOAD AT THE NAVAL POSTGRADUATE SCHOOL DUE TO THE IMPLEMENTATION OF CREDIT CARDS

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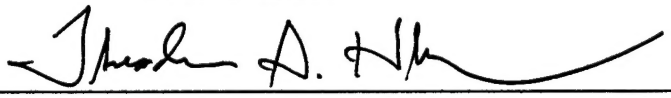
Submitted in partial fulfillment
of the requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 1995

Author: 

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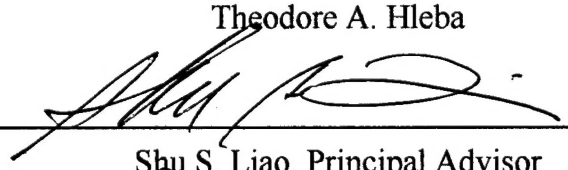
Approved by: 

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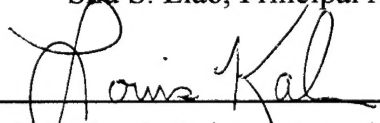

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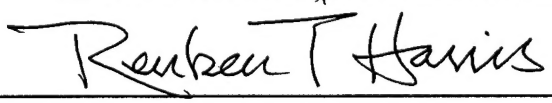

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ABSTRACT

The purpose of this thesis is to determine the impact on workload redistribution resulting from the use of government credit cards at the Naval Postgraduate School (NPS). Because workload requirements, particularly the Supply Department's, may have been redistributed across other departments at NPS, these will be identified and measured. Primary data on procurement cases was collected from the Comptroller's Department and the procurement branch of the Supply Department. Pre-credit card procedures (purchase orders, BPAs and the Imprest Fund) and related purchase action volume were identified and measured, as well as government credit card procurement procedures and related purchase action volume. The intent is to identify any workload requirements, such as technical screening, procurement and material receipt, which may have been redistributed as a result of using government credit cards.

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I. INTRODUCTION

The workload redistribution of changing procurement methods at the Naval Postgraduate School (NPS), located in Monterey, California, is the focus of this research. Specifically, this author will research the impact on workload shifting due to the use of the government-wide commercial purchase card (credit card) at NPS.

NPS uses various methods to purchase items less than $2,500.00, such as purchase orders (DD Form 1155), imprest fund, blanket purchase agreements (BPA) and the government-wide credit card. The majority of open purchase buys are in support of internal research projects which include thesis research, student experiments, faculty research and laboratory packages [Ref. 1]. In April 1991, purchasing agents in the Supply Department at NPS commenced using the government credit cards. In October 1993, they officially authorized additional cardholders for departments outside the Supply Department.

The government-wide credit card program implements a procurement initiative where commercial credit card service is used as a payment mechanism. The official name of the government credit card is International Merchant Purchase Authorization Card (IMPAC), and the General Service Administration (GSA) administered contract is with Rocky Mountain Bankcard System (RMBCS) [Ref. 2]. The credit card, when used within existing Federal Acquisition Regulations (FAR), streamlines payment procedures and reduces administrative costs [Ref. 3].

A. PURPOSE

The NPS Comptroller (Code 02) is interested in determining any workload impact resulting from the use of government credit cards at NPS. Because they may have

redistributed workload requirements (particularly the Supply Department's) across all or some departments at NPS since the advent of credit cards, the resultant impact will be researched, measured and quantified.

B. RESEARCH QUESTION

This thesis focuses on the following areas:

I. Primary Research Question: How has the workload changed at NPS due to the implementation of credit cards?

II. Subsidiary Research Questions:

1. How does the workload differ for purchases made under the old system versus credit cards?

2. Have workload requirements such as technical screening, procurement, receipt and issue been redistributed as a result of credit cards?

4. Has the Supply Department benefitted as a result of redistributing workload to other departments?

C. METHODOLOGY

Primary data on procurement cases are collected from the Comptroller's Department and the purchasing branch of the Supply Department. New (credit card) and old (manual requisitions) purchase procedures are examined and observed on behalf of the initiator(s) and the processor(s). Analysis and measurements will be accomplished using the data collected.

This thesis will be primarily a field study. Primary areas researched will be standard requisition procedures (requirements are submitted to the Supply Department and the Supply

Department initiates a procurement action other than with a credit card), new requisition procedures (requisitions via credit card), workload requirements (i.e., personnel required, time required, procedures involved) for both pre-credit card and credit card purchases, the effects of any workload redistribution or migration, and any efficiencies gained.

D. LIMITATIONS AND ASSUMPTIONS

Given the limited time for a thesis project, this research will be limited to small purchase actions (less than $2,500) at NPS. Purchases (either using purchase orders, imprest fund, BPA, or credit cards) with multiple line items were regarded as a single purchase action, i.e., whether one or more items were ordered on one document number, it was counted as a single buy. Moreover, modifications to orders were excluded from the research and therefore were not counted as a purchase action.

It is assumed the reader is familiar with the general Federal Acquisition process and small purchase procedures. The reader should also be familiar with and understand Naval terminology and basic procurement terminology.

E. BENEFITS OF STUDY

Research efforts should identify any impact (either positive or negative) on workload, or the redistribution of workload from the Supply Department to other departments at NPS. Departments affected will be identified and resourcing issues may then be identified and addressed.

F. DEFINITIONS

This section will provide the reader with definitions of some key terms which are used in this thesis. The following terms are interspersed throughout this thesis and used frequently. Therefore, this author recommends reviewing their definitions prior to proceeding any further.

Administrative fee - a percentage fee that RMBCS assesses each transaction made with the government credit card.

Approving Official - an individual who has under his purview a number of cardholders. The Approving Official is responsible for, at a minimum, reviewing his cardholders' monthly statements and verifying that all transactions made were for necessary government purchases. The Approving Official provides a critical checkpoint by reviewing the cardholders' transactions. Normally, the Approving Official is the cardholders' immediate supervisor.

Bankcard - a distinctive VISA bankcard received from RMBCS which is embossed with "FOR OFFICIAL USE ONLY" and the cardholders name. The card also bears the Great Seal of the United States and is stamped "U S GOVT TAX EXEMPT."

Cardholder - an individual designated by an agency/organization to be issued a card. This individual is responsible for adhering to all regulations, including FAR and DFAR.

Dispute - a dispute occurs when the cardholder conducts reconciliation of his account and discovers an error in either quantity or amount.

Purchase action - for purposes of this thesis, a purchase action is the procurement of supplies for an amount not to exceed $2,500.00.

Statement of account - a statement that RMBCS sends to each cardholder, which lists each transaction made during the current billing cycle.

II. CREDIT CARD PROGRAM OVERVIEW

A. PROCUREMENT REFORM INITIATIVE

The government credit card program was instituted as a procurement reform initiative, authorized by Executive Order 12352, "Procurement Reform." [Ref. 2] In 1986, the Commerce Department sponsored a pilot program to test the utility and effectiveness of government credit cards. Based on the successful pilot program, use of the government credit card was expanded throughout all branches of the government.

The government credit card represents a dramatic change and tremendous improvement in procurement practice -- the transfer of micro purchasing from procurement to program personnel. It eliminates procurement lead time, has major transaction costs savings and reduces the workload on procurement offices. For example, one government cost-benefit study assessed savings at $54.00 per transaction, based on purchase orders cost (administrative costs) an average of $94.00 while credit card purchases cost an average of $40.00 per transaction.

Government credit cards contribute to the empowerment of the workforce. A successful cross agency campaign within the government is being carried out to increase acceptance of the card. The procurement community has organized a workgroup to market the card, overcome obstacles and spread best practice. It is estimated that over the next few years the card will have cut in half the 10 million purchase orders for buys under $2,500.00, saving at least $250 million in transaction costs. [Ref. 4]

B. CREDIT CARD PROGRAM EXPANSION

The Office of Management and Budget (OMB) tasked GSA with the acquisition of government-wide commercial credit card services. GSA awarded the contract to RMBCS, a subsidiary of the Colorado National Bank. This new contract provided VISA cards for the government beginning in November 1988. [Ref. 1] The government credit card was an opportunity waiting to happen, but use of the card did not take off. One of the National Performance Review's procurement reform recommendations was to expand the use of the purchase card for small dollar items, i.e., micro purchases.

1. Expansion of the Government Credit Card Program

In August 1989, the Naval Supply Systems Command (NAVSUP) authorized all Navy activities with small purchase authority to use the government-wide commercial purchase card (i.e., credit card) for purchases under $2,500 [Ref. 5]. To further streamline procurement procedures and promote usage of the government credit card, the Federal Streamlining Act of 1994 authorized all government activities with a grant of procurement authority to use the credit card.

a. NPS Monterey Credit Card Program Overview

Cardholders were initially designated only within the Supply Department (i.e., purchasing agents) at NPS, and in 1992, sixteen cardholders existed. At this point in time, an average of 116 purchases per month were made by purchasing agents with the government credit card. Data collected indicated purchase orders and blanket purchase agreements (BPAs) still exceeded credit cards as vehicles of choice for micro purchases [Ref. 1].

Due to various reasons ranging from time factors, familiarity with other methods, ease of use and vendor acceptability, purchasing agents within the Supply Department were not using the credit card as their primary vehicle for small purchases under $2,500.00. Reluctance to use the government credit card was also observed throughout other agencies within the Federal government. For example, Annilie Kuhn of the Treasury Department said,

> The card marks a change in procurement culture. You would expect people in the agencies to jump at this - but they don't. Procurement staff are reluctant to give up the rules. There was nothing in the FAR on the card when we started and that leaves it hanging out. It became obvious that we needed a new way of behaving. We found we had to prod the procurement offices across government. They were hesitant. Issues of trust and confidence surfaced. 'How can we trust the program people not to misuse it?' 'What if they buy the wrong thing?' 'What if they buy too much?' We had to work out the concept of empowerment with the procurement offices. Our job is to empower the program people. This required a mind set change. Procurement offices are also concerned about losing people. 'If I don't have the workload anymore, will I lose the staff?' The traditional procurement official saw purchasing as his or her job. [Ref. 4: p. 4]

Since purchasing agents at NPS were not aggressively using the government credit card, the school's administration decided that the use of credit cards should perhaps be expanded to the other departments at NPS [Ref. 6]. Subsequently, NPS conducted a four month pilot program to test the usage and effectiveness of the credit card when placed in designated departments, and effective 1 October 1993, additional cardholders and approving officials were designated [Ref. 3]. As of June 1995, 89 personnel at NPS are designated cardholders.

C. CREDIT CARD USAGE AND AUTHORITY

All activities using the government credit card must follow the procedures outlined in the General Services Administration/Federal Supply Schedule (GSA/FSS) contract and other applicable procurement regulations, such as Federal Acquisition Regulations (FAR), Defense Finance Accounting Regulations Service (DFARS) and NAVSUPINST 4200.85A. In addition, activities must establish written operating procedures and ensure all government credit card users at NPS attend the NAVSUP credit card course.

The credit card can be used for small purchases up to $2,500.00, including transportation charges. A single purchase may include multiple items, and the total cost can't exceed the authorized single purchase spending limit granted to each cardholder. The items purchased must be available for immediate use, commercially available, and are not available through normal supply channels (mandatory sources of supply, stocked items, or items covered under BPAs). Partial orders, split deliveries and back-orders are not permitted. Use of the card does not relieve the cardholder from complying with existing Department of the Navy or FAR regulations, such as the Buy American and Anti-Deficiency Acts. The most cost-effective purchase method must be used. [Ref. 3]

III. PRE-CREDIT CARD PURCHASE PROCEDURES

This chapter will discuss the purchase procedures used prior to the implementation of government credit cards at NPS, i.e., obtaining items through standard stock or open purchase via purchase orders, BPAs, etc. It will cover the steps from requirement generation, obligation of funds, procurement and receipt of the material/item. Workload requirements, such as the aggregate time required to complete a purchase action, will be discussed. Turn-around time (TAT), Procurement Administrative Lead Time (PALT), float and ancillary administrative time will not be discussed.

A. REQUIREMENT GENERATION AND SUBMISSION

The first step in all transactions to obtain material or services is requirement generation, i.e., the customer has a need for some specific item or service. Once the customer generates his requirement and determines the requirement's urgency of need, the requirement is then submitted to the Supply Department's Issue Control Branch. At NPS, requirements are normally submitted to the Supply Department via NPS Form 4222 or DD Form 1348, depending on the supply source.

Generally, if the requirement is for material available from a federal source of supply (standard stock, DLA, GSA, etc.), the DD Form 1348 is used; otherwise, the NPS Form 4222 is used for direct purchases from commercial sources [Ref. 7].

B. REQUIREMENT SCREENING/TECHNICAL SCREENING

Prior to procuring any material and services, the Supply Department 's Issue Control Branch conducts technical screening of all requirements. Each requirement document is

checked for accuracy and completeness. Secondly, mandatory sources of supply are checked for availability prior to considering purchase of the item commercially. It is important to note that all requirements are to be technically screened, including those which may be satisfied by using a government credit card [Ref. 3]. However, a recent Federal Acquisition Regulation (FAR) change now allows the use of credit cards to purchase items less than $100.00, even if the item is a standard stock item [Ref. 8]. For this thesis, the author assumed all requirements reviewed were first screened against mandatory sources of supply.

1. Mandatory Sources of Supply

As stated in Section A above, two primary methods and various sources exist for the procurement of supplies and services. The open purchase method is used only when other mandatory sources fail to provide the requested material. The mandatory sources, listed in priority sequence, are:

1. DoD Excess Property (see Subsection a.)
2. DoD Standard Stock
3. GSA Stores Stock
4. Blind/Handicapped and Federal Prison Industries
5. GSA Contracts

a. Ready Supply Stores and Office Supply Issueroom Items

Ready Supply Stores (RSS) and Office Supply Issueroom (OSI) items are low cost, common use (consumable) items, centrally procured and managed by the Supply Department. The purpose of RSS and OSI items is to have high usage, consumable items readily available to all customers. These items are listed on the school's mainframe

computer and are published in a catalog for easy accessibility to Supply Department personnel and their customers.

In addition to first screening requirements against DoD excess property, the Supply Department screens the RSS and OSI sources prior to checking other secondary sources, such as DoD standard stock or GSA [Ref. 7]. The requirement is filled if either RSS or OSI stock can satisfy the requirement.

C. OBLIGATION OF FUNDS

Upon completion of technical screening, the document is then forwarded to the Comptroller, where funds are obligated. Whether the requirement is satisfied from a mandatory source of supply (i.e., a Navy stock point, RSS, OSI) or through open purchase, BPA or Imprest Fund, funds must be obligated -- only the timing of when funds are obligated will differ.

Literally thousands of Job Orders exist at NPS. Job Orders are used to track the use of funds, i.e., how funds are spent, which funds are used to procure certain items, etc. For simplicity, this section will gloss over the intricacies of Job Order assignment and tracking. In essence, upon receipt and review of the document, the Comptroller obligates the requisite funds and returns the document to the Supply Department's Issue Control Branch. Delivery of documents to and from the Supply Department and Comptroller is normally done via Guard Mail.

D. PROCUREMENT

When funds have been obligated, one of the Supply Department's purchasing agents or a team leader will prepare the DD Form 1155, which is used as the ordering mechanism

for an open purchase transaction. The DD 1155 serves as a contract between NPS and commercial vendors.

The DD 1155 is then forwarded to a Contracting Officer, who signs the DD 1155 and thereby authorizes procurement on behalf of NPS. The signed and completed DD 1155 is then returned to the purchasing agent or team leader, who then officially places the order for supplies and services with the vendor.

Copies of the DD 1155 are then distributed and filed. A copy is forwarded to the Receipt Control Branch and the Shipping/Receiving Warehouse (Building 349). The Receipt Control Branch uses their copy to certify the receipt (obtained from the Shipping/Receiving Branch) and invoice, thereby completing the financial process so the vendor may subsequently be paid. The Shipping/Receiving Branch uses their copy to assist in receipt of the item.

E. MATERIAL RECEIPT

Material receipt, i.e., actually obtaining the material requested and distributing it to the end user, is the last step in this process. Subsequent steps such as forwarding paperwork to the Authorized Accounting Activity (AAA) for payment, funds disbursement, resolving discrepancies, etc., will be omitted, as they are beyond the scope of this thesis.

The Receiving and Shipping Branch, located in Building 349, receives and inspects all incoming material and then forwards the material to the proper location. All material ordered with appropriated funds at NPS is to be received by an appointed Receiving Officer, who inspects the delivery for quantity and quality. [Ref. 7]

As briefly stated above in Section D, when the Receiving and Shipping Branch completes the receipt process (assuming no discrepancies were noted), the appropriate paperwork is forwarded to the Receipt Control Branch, where the invoice and receipt are matched, verified and certified for payment by the AAA.

F. WORKLOAD REQUIREMENTS

Workload requirements, i.e., the average time required for the Supply Department to complete BPA, Imprest Fund and Purchase Order transactions (under $2,500.00) will be discussed. This data was obtained from a master's thesis completed in 1992, and the author believes the data to be correct and accurate. Two time factors considered but not included in the referenced thesis were the processing of a purchase request through the Comptroller and technical screening, as the time for each procurement method was considered to be relatively the same [Ref. 1]. However, for purposes of comparing workload requirements in this thesis, these factors will be included as they influence workload redistribution.

1. Blanket Purchase Agreements (BPA)

BPAs were noted to take approximately .81 hours per purchase, or an average of 49 minutes per transaction. BPA average transaction time is summarized below:

.27	hours per BPA transaction, procurement division
.11	hours per receipt, receiving warehouse
.18	hours technical screening and comptroller support (obligation)
.25	administrative support
.81	total hours per BPA transaction

2. Imprest Fund

Imprest fund transactions were noted to take approximately .50 hours per purchase, or an average of 30 minutes per transaction. Imprest fund average transaction time is summarized below:

.13	hours per Imprest Fund transaction, Imprest Fund Custodian
.11	hours per receipt, receiving warehouse
.18	hours technical screening and comptroller support (obligation)
.08	administrative support
.50	total hours per Imprest Fund transaction

3. Purchase Orders

Purchase order transactions were noted to take approximately .89 hours per purchase, or an average of 53 minutes per transaction. Purchase order average transaction time is summarized below:

.35	hours per Purchase Order transaction, procurement division
.11	hours per receipt, receiving warehouse
.18	hours technical screening and comptroller support (obligation)
.25	administrative support
.89	total hours per Purchase Order transaction

4. Average Workload Requirements

Subsections one through three above summarize the average times to complete a purchase action for requirements valued at less than $2,500.00. To compare workload requirements for one average micro purchase action accomplished by the Supply Department versus one purchase action accomplished with a credit card, a weighted average of the three processes (BPA, imprest fund and purchase order) is required:

	BPA	IF	PO		Total
Average time	.81	.50	.89		
Average per month	216	67	360		
Weight	.34	.10	.56		
Weighted Average	.275	.05	.498	=	0.823

Based on the weighted average calculations above, the average time for the Supply Department to accomplish one purchase action, using either BPA, Imprest Fund (IF) or Purchase Order (PO), is .823 hours, or approximately 49.38 minutes.

IV. CREDIT CARD PURCHASE PROCEDURES

This chapter will discuss the purchase procedures when a government credit card is used at NPS. It will discuss the steps from requirement generation through the monthly reconciliation process, which is essentially the last step in the credit card purchase loop. Many of the procedures are similar to those discussed in Chapter III; therefore, they will not be discussed in detail and only important parts will be discussed. Workload requirements, such as the average time to complete a purchase action with a government credit card, will be discussed.

It should be noted that the following sections discuss the overall program requirements in general, including the requisite documentation and procedural steps, used to administer the government credit card program. Each department and cardholder at NPS may accomplish each step differently. For example, one cardholder maintains a purchase log on an electronic spreadsheet while others use paper logs, and each applicable Approving Official interacts in the process at slightly different times; however, the intent of instructions are regulations are met.

A. REQUIREMENT GENERATION AND SUBMISSION

Similar to the procedures for obtaining material with methods other than a government credit card (i.e., purchase order, BPA or Imprest Fund), requirement generation is the first step. The end user normally submits his requirement to the designated cardholder using NPS Form 4222. Because the government credit card is used to procure items other than standard stock, the end users' requirement must be clear.

B. TECHNICAL SCREENING

Requirement submitted to the cardholder for procurement are to be technically screened, i.e., mandatory sources of supply must be checked first. However, a recent FAR change now allows procurement via a credit card for items under $100.00, even if it is a standard stock item (see page 12).

Upon completion of technical screening, the cardholder is required to complete and maintain a technical screening sheet [Ref. 3]. At this point, the cardholder normally is ready to contact the vendor and place the order, assuming funds are available.

C. OBLIGATION OF FUNDS

Funds must be available prior to any purchase action. As opposed to the procedures discussed in Chapter III, where each individual purchase action is obligated, a lump sum approach is used. This is to ensure funds are committed before a purchase action is initiated with a government credit card [Ref. 9].

The Comptroller obligates a lump sum amount at the beginning of each month to cover estimated credit card buys. This will satisfy the fiduciary responsibility of appropriation law, which requires reservation of funds for estimated expenses of the credit card program. Upon receipt of monthly reconciled invoices, this administrative obligation will be reversed and the actual charges to the accounts will be processed. [Ref. 3]

Each cardholder at NPS is required to maintain a Bankcard Purchase Log, which assists the cardholder in managing account balances. This log will be discussed further in the following section.

D. PROCUREMENT

It is normally in this step that the applicable Approving Official is contacted to obtain approval to place the order. When the cardholder has determined the requirement is valid and funds are available, he normally is ready to place the order with a vendor. However, certain conditions must be met prior to placing an order with a government credit card.

1. Conditions for Placing Credit Card Orders

It is important to note that it is illegal to require a vendor to accept the government credit card as a requirement for doing business. If a cardholder cannot process an order with a particular vendor because the vendor does not accept the credit card, the cardholder must ensure a requisition for that order is placed with the Supply Department. [Ref. 3]

The cardholder must ensure purchases are not broken down or split into separate orders to circumvent the maximum $2,500.00 spending limit. Credit card purchases may be accomplished without obtaining competition if the cardholder determines the price to be fair and reasonable.

The supplies must be immediately available. No back orders or partial deliveries are permitted. State or local sales tax may not be added.

2. Bankcard Purchase Log

Each cardholder at NPS is required to maintain a log of all orders placed. This log contains information such as the item, order date, requisition number, job order number, quantity, unit price, extended price and receipt information (quantity and date received). The log is normally completed by the cardholder while placing an order with a vendor.

Because such detailed information is contained in this log, it assists the cardholder with managing account balances and is a key document in the monthly reconciliation process. In addition, it is useful for assisting in other processes at NPS.

a. Bankcard Purchase Log Document Distribution

Copies of the log must be made and distributed as part of documentation requirements (audit trails) and funds disbursement. Copy #1 is retained by the cardholder for audit purposes; copy #2 is forwarded to the Comptroller (Code 211) each Friday so fund balances may be monitored; copy #3 is retained and matched with charge slips, receipts and invoices; copy #4 is forwarded weekly to the NPS Property Management Branch for plant property accounting purposes.

E. MATERIAL RECEIPT

Normally, actual physical receipt of the requested item is the last step in most procurement processes. However, for purchases using the government credit card, a lengthy monthly reconciliation process follows, which will be discussed in the following section.

As discussed in Chapter III (see page 14), most material ordered using a method other than a government credit card is physically received at the Supply Department's Building 349. However, material ordered with a credit card is normally shipped to the applicable cardholder's office, as the receiving warehouse has no record of the order. Also, material ordered with a government credit card may be picked up at the vendor's location.

When the cardholder receives the material, he obtains the signature of the person who requested the item. This is done to ensure that separation of duties are maintained. Also, the cardholder verifies that the receipt/invoice match what was actually ordered.

F. MONTHLY RECONCILIATION

The final step in the normal (assuming no discrepancies) government credit card purchase process is the monthly reconciliation process. At the end of each monthly billing cycle, RMBCS mails each cardholder a Statement of Account (herein referred to as statement). This statement itemizes each transaction which was charged to the cardholder's credit card.

The cardholder reviews the statement for accuracy. Previously completed bankcard purchase log entries are matched to transactions listed on the statement. Each transaction on the statement is annotated with its corresponding requisition number so it cross references to the applicable entry in the purchase log. Also, the cardholder must prorate an administrative fee, calculated on a fixed percentage of the total dollar value of the purchases, to each item purchased.

Concurrently, the cardholder is required to complete a NAVCOMPT Form 2035, Summary Of Accounting Data. This form contains information for each transaction such as appropriation data, cost codes, dollar amounts and requisition numbers.

Upon completion of the reconciliation, the cardholders signs the statement and forwards it to his Approving Official. The Approving Official reviews this package against a composite statement, which he receives for each cardholder under his purview. Finally, this package is forwarded to the Comptroller, who then pays RMBCS via electronic means.

G. WORKLOAD REQUIREMENTS

Workload requirements, i.e., the average aggregate time required for completion of an average government credit card purchase action, will be discussed. This author

interviewed eleven cardholders from six different departments at NPS. Cardholders were each asked the same questions for an average (average means assuming no discrepancies or unusual circumstances) credit card transaction. The cardholders' responses were quite similar and devoid of any wild fluctuations, and their credit card usage ranged from very little to over hundreds of transactions each month.

1. Questionnaire Summary

The following questions were asked of each cardholder interviewed, and the mean represents the average time of all respondents.

1. On average, how long does it take you to conduct technical screening for an average government credit card transaction? The mean response time was 11.29 minutes.

2. On average, how long does it take you to place an order with a vendor (i.e., actually make the call, explain policies about no back ordering or partial deliveries, etc.), obtain approval from the Approving Official and complete the purchase log? The mean response time was 10.4 minutes.

3. On average, how long does it take you to complete the receipt process, i.e., obtain the necessary signature(s) and check the receipt/invoice against the item? The average response time was 9.14 minutes.

4. On average, how long does it take you to perform the monthly reconciliation for an average transaction, assuming it was an average month? The mean response time was 10.31 minutes.

2. Average Workload Requirements Summary

The following summarizes the average times to complete one average government credit card (CC) purchase action:

.19	hours per CC order, technical screening
.17	hours per CC order, procurement (order with vendor)
.15	hours per CC order, material receipt
.17	hours per CC order, monthly reconciliation
.686	total hours per CC order (difference due to rounding)

Therefore, the average time for a cardholder at NPS to accomplish one purchase action using a government credit card is .686 hours, or approximately 41.14 minutes.

V. IMPACT ON WORKLOAD - DATA ANALYSIS

This chapter will provide the reader with the data collected and discuss the analysis of data for purchase actions less than $2,500.00, which were accomplished using a government credit card or other method (purchase order, BPA and Imprest Fund).

The data collected include the purchase volume by month and quarter, and average workload requirements (i.e., aggregate time required for each, discussed in Chapters III and IV) for either a credit card purchase or non-credit card purchase. Comparison of the data for the different purchase methods will be discussed, and any workload redistribution or impact on workload will be identified.

Finally, the author will provide his analysis, opinion and discussion of future workload redistribution. This will be accomplished by using the classical decomposition method of time series analysis.

A. DATA SOURCES

One of the two primary data sources is the DD Form 1057, Monthly Contracting Summary of Actions $25,000.00 or Less, which lists the number of purchase actions by category, i.e, less than $1,000.00, $1,001.00 to $2,500.00, $2,501.00 to $10,000.00, etc. For this thesis, the less than $1,000.00 and $1,001.00 to $2,500.00 categories were combined into one single "less than $2,500.00" category. Because of inconsistencies in the Supply Department's documentation and procedural changes, the DD Form 1057 did not list the number of purchase actions accomplished using the government credit card.

The primary data source for credit card purchase volume is the Comptroller's composite Statement of Account provided by RMBCS. It should be noted that the Statement of Account lists transactions by billing cycle versus actual volume per month; however, in the long run and for purposes of this thesis, any minor differences due to timing will wash through.

As discussed earlier (see page 3), it is important to note that all purchases (either using purchase orders, BPA, Imprest Fund or government credit card) with multiple line items were regarded as a single purchase action.

B. DATA PRESENTATION - PURCHASE ACTION VOLUME

This section will provide the reader with data listed in several tables. First, the data will be presented by month so the reader can obtain an overview of all the data. The average dollar value per purchase will be presented to show any trends in purchase action methods. Finally, the data will be provided in a quarterly summary.

1. Volume for All Purchase Methods

Data collected for the months from July 1993 through June 1995 are listed in Table 1 (see page 32). It should be noted that this table lists the monthly purchase action volume for both credit cards and other purchase methods, i.e., purchase orders, BPAs and Imprest Fund.

Column B (Credit Card) lists each month's purchase action volume using only the government credit card. Column C (Under $2.5K) lists each month's purchase volume using either purchase orders, BPAs or Imprest Fund (excluding credit card purchases). Columns D and E, which list two other purchase dollar amount categories, are provided for illustration

purposes and to later show these two categories have remained relatively stable in volume. Column F lists the total purchases for each month. Column G lists the figures for credit card purchases as a percent of the total purchases per month. Column H lists the figures for credit card purchases as a percentage of all purchases under $2,500.00 (which includes credit cards, purchase orders, BPAs and Imprest Fund). Finally, the bottom of the table lists the category totals, the average purchases, and the minimum and maximum purchase actions per month, by category.

By reviewing the summary at the bottom of Table 1, it is quite easy to see that 94.7 percent of all purchase actions for the period July 1993 through June 1995 at NPS were for purchases less than $2,500.00 (micro purchases). Credit card purchases make up 63 percent of all purchase actions and 66.5 percent of purchases under $2,500.00.

2. Volume for Pre-Credit Card Purchases

Data collected for the months from October 1991 through June 1993 are listed in Table 2 (see page 33). It should be noted that this table lists the monthly purchase action volume for purchases made with purchase orders, BPAs and the Imprest Fund.

Column B (Under $2.5K) lists each month's purchase volume using either purchase orders, BPAs or Imprest Fund. Columns C and D, which list two other purchase dollar amount categories, are provided for illustration purposes. Column E lists the total purchases for each month. Column F lists the figures for purchases under $2,500.00 as a percentage of the purchases. Finally, the bottom of the table lists the category totals, the average purchases, and the minimum and maximum purchase actions per month, by category.

Therefore, it is easy to see that 89.2 percent of all purchase actions for the period October 1991 through June 1993 were for purchases less than $2,500.00.

3. Quarterly Summary of All Purchase Methods

Data collected for the months October 1991 through June 1995 are summarized by quarter in Table 3 (see page 34). The data was summarized by quarter to help smooth, by averaging, any aberrations due to seasonal fluctuations and fiscal constraints. The quarterly data summary will be the primary source for analysis and comparison.

It should be noted that this table lists the quarterly purchase action volume for both credit cards and other purchase methods, i.e., purchase orders, BPAs and Imprest Fund. Also, the caption "Pre-credit card summary" begins the summary for purchase action methods used prior to the use of credit cards at NPS, i.e., purchase orders, BPA and Imprest Fund. The caption "Using credit cards summary" begins the summary for both the aforementioned category, as well as the summary for the credit card purchase method, for the dates July 1993 through June 1995.

In Table 3, Column B (credit card) lists each quarter's purchase volume using the government credit card. Column C lists the purchase volume for all other purchase methods (purchase order, BPA or Imprest Fund) less than $2,500.00. Columns D and E, which list two other purchase dollar amount categories, are provided for illustration and continuity purposes. Column F lists the total purchases for each quarter. Column G lists the figures for credit card purchases as a percentage of the total purchases. Column H lists the figures for all other purchases (i.e., non-credit card purchases) less than $2,500.00 as a percentage of the total purchases. Finally, the bottom of the table lists the category totals, the average purchases, minimum and maximum purchase actions per month, by category.

		Non-Credit Card Purchases					
A Month	B Credit Card	C Under $2.5K	D $2.5K-$10K	E $10K-$25K	F Total Purch	G CC as % of Total	H CC as % All <$2.5K
Jul 93	226	338	41	9	614	36.8%	40.1%
Aug 93	357	479	55	25	916	39.0%	42.7%
Sep 93	355	686	158	43	1,242	28.6%	34.1%
Oct 93	264	142	18	2	426	62.0%	65.0%
Nov 93	282	233	16	4	535	52.7%	54.8%
Dec 93	414	245	21	4	684	60.5%	62.8%
Jan 94	429	275	25	2	731	58.7%	60.9%
Feb 94	485	195	18	2	700	69.3%	71.3%
Mar 94	528	280	35	8	851	62.0%	65.3%
Apr 94	461	211	24	8	704	65.5%	68.6%
May 94	454	204	22	11	691	65.7%	69.0%
Jun 94	583	303	29	16	931	62.6%	65.8%
Jul 94	627	164	27	9	827	75.8%	79.3%
Aug 94	732	303	30	13	1,078	67.9%	70.7%
Sep 94	782	352	101	50	1,285	60.9%	69.0%
Oct 94	497	137	17	8	659	75.4%	78.4%
Nov 94	495	190	17	6	708	69.9%	72.3%
Dec 94	533	264	17	7	821	64.9%	66.9%
Jan 95	514	208	21	7	750	68.5%	71.2%
Feb 95	758	168	20	7	953	79.5%	81.9%
Mar 95	647	261	28	8	944	68.5%	71.3%
Apr 95	813	231	15	6	1,065	76.3%	77.9%
May 95	726	287	19	9	1,041	69.7%	71.7%
Jun 95	774	261	26	10	1,071	72.3%	74.8%
Totals	12,736	6,417	800	274	20,227	63.0%	66.5%
Average	531	267	33	11	843		
Min	226	137	15	2	426		
Max	813	686	158	50	1,285		

Table 1. Purchase Action Volume for All Purchase Methods, Jul 1993 - Jun 1995

A Month	B Under $2.5K	C $2.5K- $10K	D $10K- $25K	E Total Purch	F Under $2.5K as % of Total
Oct 91	333	35	18	386	86.3%
Nov 91	460	22	5	487	94.5%
Dec 91	575	23	6	604	95.2%
Jan 92	635	38	8	681	93.2%
Feb 92	469	36	8	513	91.4%
Mar 92	786	65	8	859	91.5%
Apr 92	623	49	10	682	91.3%
May 92	701	69	32	802	87.4%
Jun 92	582	59	28	669	87.0%
Jul 92	545	72	26	643	84.8%
Aug 92	714	86	21	821	87.0%
Sep 92	774	166	41	981	78.9%
Oct 92	225	16	6	247	91.1%
Nov 92	404	22	5	431	93.7%
Dec 92	503	35	12	550	91.5%
Jan 93	404	23	8	435	92.9%
Feb 93	630	38	11	679	92.8%
Mar 93	444	38	17	499	89.0%
Apr 93	465	42	12	519	89.6%
May 93	296	50	20	366	80.9%
Jun 93	432	26	15	473	91.3%
Totals	11,000	1,010	317	12,327	89.2%
Average	524	48	15	587	
Min	225	16	5	247	
Max	786	166	41	981	

Table 2. Purchase Volume for Pre-Credit Card Purchases, Oct 1991 - Jun 1993

		Non-Credit Card Purchases					
A Quarter	B Credit Card	C Under $2.5K	D $2.5K - $10K	E $10K - $25K	F Total Purch	G CC as % of Total	H Under $2.5K as % Total
Oct-Dec 91		1,368	80	29	1,477		92.6%
Jan-Mar 92		1,890	139	24	2,053		92.1%
Apr-Jun 92		1,906	177	70	2,153		88.5%
Jul-Sep 92		2,033	324	88	2,445		83.1%
Oct-Dec 92		1,132	73	23	1,228		92.2%
Jan-Mar 93		1,478	99	36	1,613		91.6%
Apr-Jun 93		1,193	118	47	1,358		87.9%
Jul-Sep 93	938	1,503	254	77	2,772	33.8%	88.1%
Oct-Dec 93	960	620	55	10	1,645	58.4%	96.0%
Jan-Mar 94	1,442	750	78	12	2,282	63.2%	96.1%
Apr-Jun 94	1,498	718	75	35	2,326	64.4%	95.3%
Jul-Sep 94	2,141	819	158	72	3,190	67.1%	92.8%
Oct-Dec 94	1,525	591	51	21	2,188	69.7%	96.7%
Jan-Mar 95	1,919	637	69	22	2,647	72.5%	96.6%
Apr-Jun 95	2,313	779	60	25	3,177	72.8%	97.3%
Pre-credit card summary:							
Totals	N/A	11,000	1,010	317	12,327	N/A	89.2%
Avg/Qtr	N/A	1,571	144	45	1,761		
Avg/Mo	N/A	524	48	15	587		
Min/Qtr	N/A	1,132	73	23	1,228		
Max/Qtr	N/A	2,033	324	88	2,445		
Using credit cards summary:							
Totals	12,736	6,417	800	274	20,227	63.0%	94.7%
Avg/Qtr	1,592	802	100	34	2,528		
Avg/Mo	531	267	33	11	843		
Min/Qtr	938	591	51	10	1,645		
Max/Qtr	2,313	1,503	254	77	3,190		

Table 3. Quarterly Purchase Action Volume Summary, Oct 1991 - Jun 1995

4. Average Dollar Value Per Purchase Action

Data collected for the months October 1991 through June 1995 are summarized by quarter in Table 4. The average dollar value per purchase action, whether by credit card or other purchase method, was summarized by quarter to help smooth any aberrations due to seasonal fluctuations and fiscal constraints. These data are presented to reveal any trends in purchase action methods. For example, is the increased use of credit cards for micro purchases due to the cards' ease, or is it easier to circumvent the $2,500.00 purchase limit with a credit card?

A Quarter	B Other Methods	C Credit Cards
Oct-Dec 91	$414	
Jan-Mar 92	$463	
Apr-Jun 92	$506	
Jul-Sep 92	$573	
Oct-Dec 92	$410	
Jan-Mar 93	$566	
Apr-Jun 93	$578	
Jul-Sep 93	$668	$483
Oct-Dec 93	$408	$489
Jan-Mar 94	$469	$533
Apr-Jun 94	$484	$477
Jul-Sep 94	$667	$615
Oct-Dec 94	$469	$570
Jan-Mar 95	$463	$528
Apr-Jun 95	$409	$517
Overall Average	**$523**	**$537**

Table 4. Average Dollar Value Per Purchase Action

In Table 4, Column B (Other Methods) lists the average dollar value for purchases made with either purchase orders, BPAs or the Imprest Fund. Column C lists the average dollar value for purchases made with the government credit card. At the bottom of the table, the overall average dollar value per purchase action is listed ($523 for non-credit card purchases and $537 for credit card purchases).

C. DATA ANALYSIS

This section will provide the reader with a discussion and analysis of the data presented in the previous section, as well as the timing figures from Chapters III and IV. Analysis will be conducted primarily from the data provided in Table 3, Quarterly Purchase Action Volume Summary, October 1991 through June 1995.

1. Shift in Purchase Action Methods

Perhaps the easiest way to understand when, how and why the purchase action volume and methods changed at NPS is to have the data presented graphically. Figure 1 provides a summary of all purchase methods. As mentioned earlier, the two large purchase categories ($2.5K - $10K and $10K - $25K) and their purchase action volume are not particularly relevant to the scope of this thesis; however, they have remained relatively stable throughout the period analyzed. Because these two categories' volumes have remained relatively stable, it can be inferred that workload was not redistributed to or from these categories as a result of the government credit cards' usage at NPS.

As illustrated in the Figure 1, in the last quarter of fiscal year 1993 (Jul - Sep 93), the under $2.5K category remained near the average per quarter of 1,571 purchases. However, the under $2.5K category then dropped sharply from 1,503 to 620 beginning in October 1993 (fiscal year 1994). This occurred approximately one quarter after credit cards were being used at departments outside of the Supply Department at NPS; the divergence between the growth of credit card usage and decline of other micro purchase methods (the under $2.5K

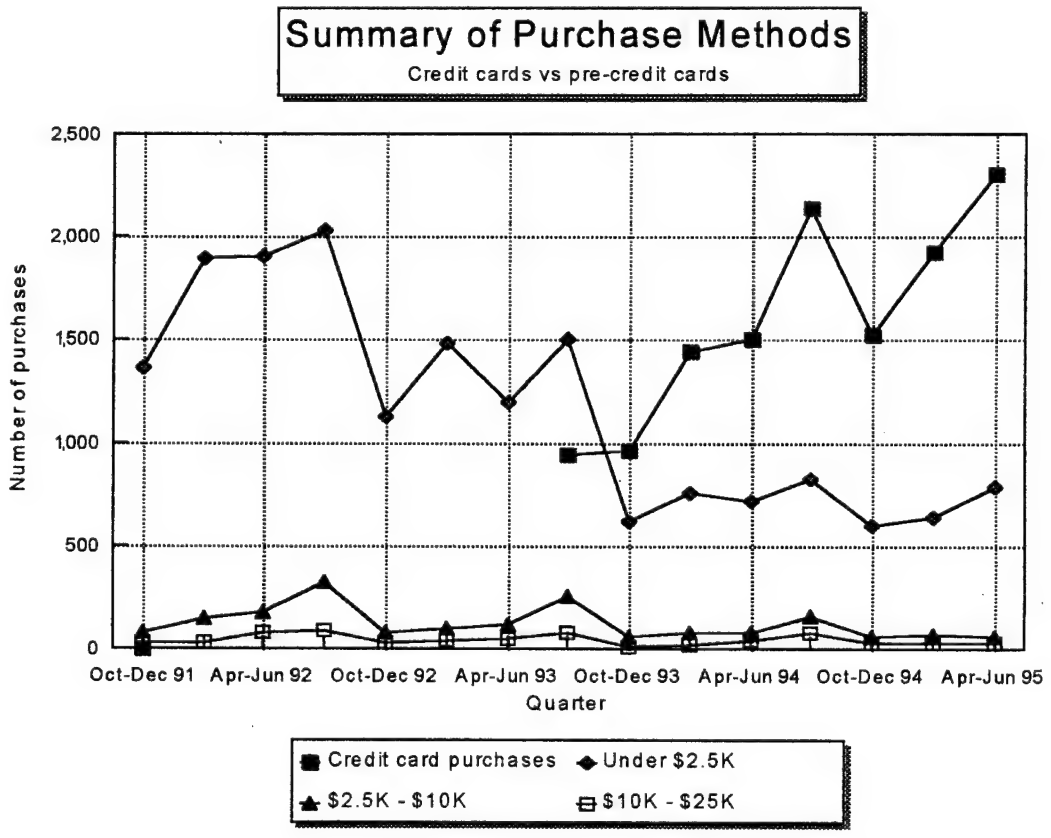

Figure 1

category) is readily apparent. After this period, the average number of purchases made using either purchase orders, BPAs or the Imprest Fund (i.e., the under $2.5K category) dropped

from 1,571 per quarter to 802 per quarter. This represents a 48.9 percent decrease in volume per quarter for purchases less than $2,500.00 made by the Supply Department.

To obtain a clearer visual representation of how the micro purchase methods have changed, see Figures 2 and 3, which show that a much smaller number and proportion of micro purchases are being made with either purchase orders, BPAs or the Imprest Fund.

While the data in Figure 1 shows a large decline in the average purchase volume for the under $2.5K category, the minimum and maximum per quarter categories changed as well. For instance, before the use of government credit cards the minimum number of

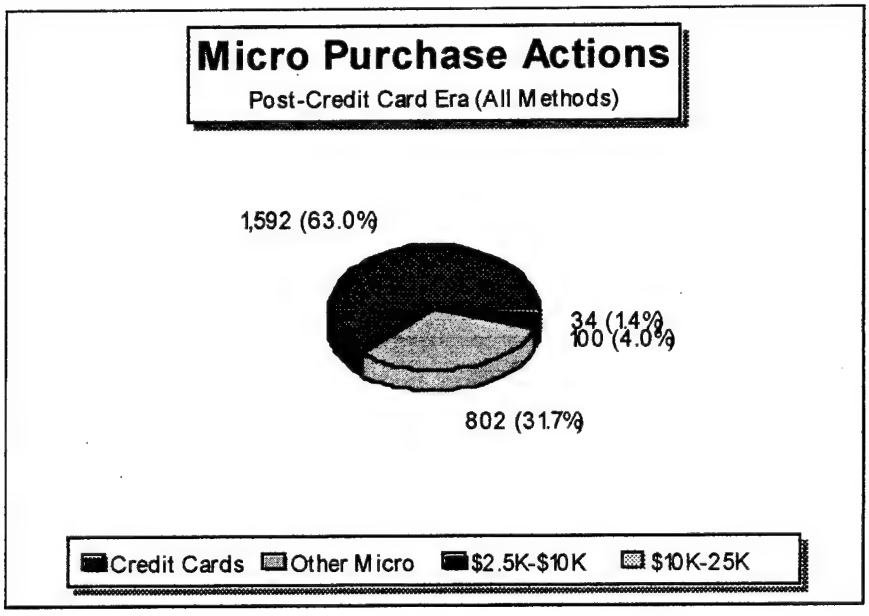

Figure 2

purchase actions accomplished was 1,132 per quarter. After the advent of credit cards, the minimum number of purchase actions is 591 per quarter, representing a 47.8 percent decrease in volume. This indicates a change in the micro purchase methods at NPS, i.e., the way goods are obtained.

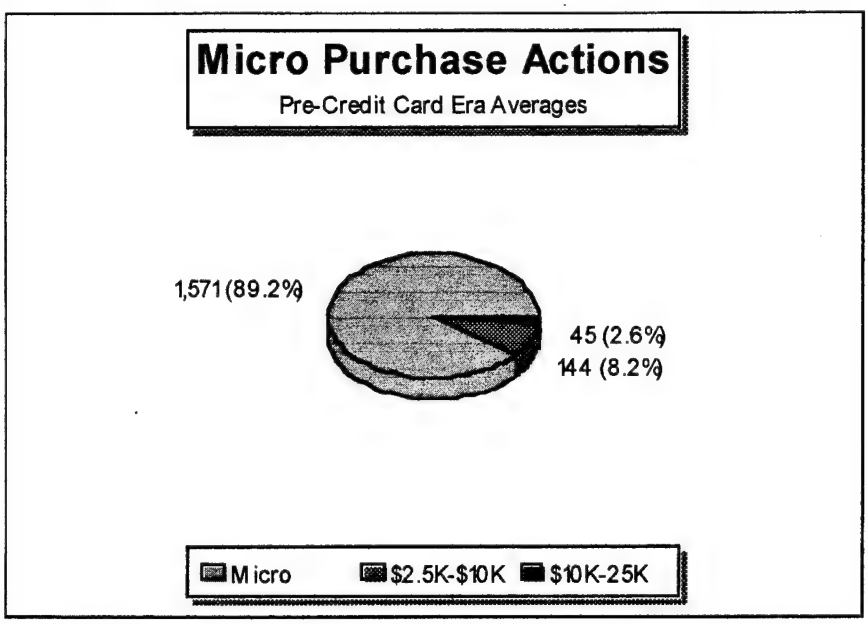

Figure 3

The maximum number of under $2.5K purchase actions dropped from 2,033 per quarter to 1,503 per quarter, a 26 percent decrease. It is interesting to note that the current maximum of 1,503 micro purchase actions is now less than the former quarterly average of 1,571 purchase actions for the pre-credit card era. These data clearly show that the use of credit cards at NPS has reduced the micro purchase action volume of the Supply Department. The vehicle of choice has shifted from using purchase orders, BPAs and the Imprest Fund issued by the Supply Department, to departments using the government credit card. Figure 4, a stacked bar graph, helps to show this change in volume between credit cards and other micro purchase methods.

As the data in Table 3 indicates and as illustrated in Figures 2 and 3, micro purchase actions (including credit cards, purchase orders, BPAs and the Imprest Fund) account for almost 95 percent of all purchase actions at NPS. The government credit card now accounts for 63 percent of all purchase actions. In addition, it makes up the vast majority of micro

purchase actions, accounting for 66.5 percent of all micro purchase actions. Therefore, other micro purchase actions now account for only 31.7 percent of all purchase actions as compared to the pre-credit card era volume of 89.2 percent.

a. Why the shift in purchase methods?

Was the shift from making purchases with other micro purchase methods (purchase orders, BPAs and the Imprest Fund) to making purchases with credit cards due to the credit cards' ease of use, or was it easier to circumvent the $2,500.00 purchase limit with a credit card? In other words, if the average dollar value per purchase action for a credit card was consistently lower than the average dollar value per purchase action for other micro purchase methods, then it may be inferred that the credit card was being used to split orders (circumvent) to remain under the $2,500.00 per order limitation.

From the data contained in Table 4 (see page 35), the overall average dollar value for a non-credit card purchase action is $523.00 and the overall average dollar value for a credit card purchase action is $537.00. Since the overall credit card dollar value average is greater than the overall dollar value average for non-credit card purchases, it appears that the credit card is not the preferred micro procurement method because it may be easier to split purchase orders. In other words, the credit card is used in the vast majority of micro purchase actions because it is easier to use and faster to obtain material.

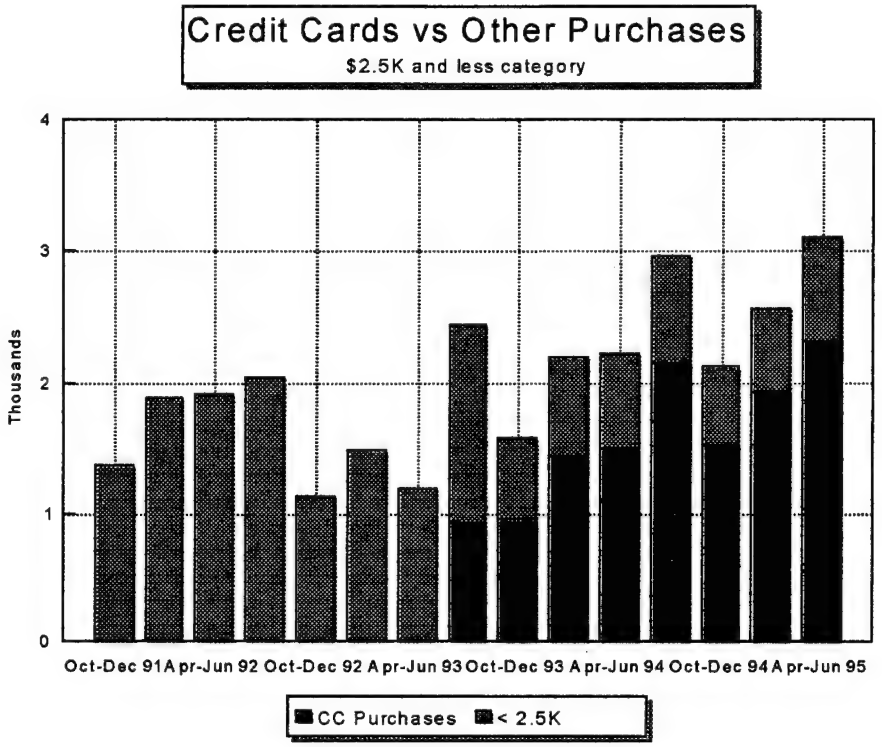

Figure 4

2. Computation of Workload

As previously discussed in Chapters III and IV, the average workload requirement to complete one average pre-credit card micro purchase action using either a purchase order, BPA or Imprest Fund is .823 hours. The average workload requirement to complete one average purchase action using a government credit card is .686 hours.

Based on the average workload requirement (time), the workload computations for pre-credit card transactions for the Supply Department follow:

	Pre-Credit Card
Average workload (time) times	.823 hr X
Avg purchase actions/Qtr Oct91 - Jun93	1,571 avg/qtr
Equals the total avg hours/Qtr	1,292.93 hr
Times four quarters/year equals	5,171.73 hr
Divided by 2,080 hours equals	2.486 man years of effort

	Pre-Credit Card
Average workload (time) times	.823 hr X
Avg purchase actions/Qtr Jul93 - Jun 95	802 avg/qtr
Equals the total avg hours/Qtr	660.05 hr
Times four quarters/year equals	2,640.18 hr
Divided by 2,080 hours equals	1.269 man years of effort

As the computations above indicate, the average workload requirement for pre-credit card purchase actions has decreased by 1.217 man years (2.486 - 1.269 = 1.217). This difference indicates that approximately 48.9 percent, or 1.269 man years, of the Supply Department's workload has changed and/or shifted to other departments at NPS.

Based on the average workload requirement (time), the workload computations for the cardholders in the user departments (outside of the Supply Department) to complete credit card transactions follow:

	Credit Card
Average workload (time) times	.686 hr X
Avg purchase actions/Qtr Jul93 - Jun95	1,592 avg/qtr
Equals the total avg hours/Qtr	1,092.11 hr
Times four quarters/year equals	4,368.45 hr
Divided by 2,080 hours equals	2.1 man years of effort

As discussed earlier, workload in the amount of 1.217 man years has changed in the Supply Department. In other words, over time, their workload has decreased due to a

change in the way micro purchases are done at NPS. Whether the personnel formerly required to accomplish the work have either left the Supply Department or have been reassigned to other duties is beyond the scope of this thesis; what is important is that due to a change in procurement methods, workload requirements have changed at NPS.

Before the use of credit cards in departments outside of the Supply Department, all micro purchase actions were done by Supply Department personnel, with the exception of RSS and OSI. In other words, the Supply Department was solely responsible for placing orders, preparing and maintaining the proper paperwork, conducting liaison with vendors, and receiving the items. Since the advent of credit cards, additional personnel outside of the Supply Department now are responsible for micro purchase actions at NPS -- almost 63 percent of all purchases at NPS are done by government credit card holders outside of the Supply Department. The total workload requirement of 2.1 man years for credit card purchase actions can be considered an additional requirement to existing personnel resources at NPS. Therefore, it would be logical to state that the workload has shifted, in the amount of 3.317 (2.1 + 1.217 = 3.317) man years, when credit card usage was implemented at departments outside of the Supply Department.

3. Forecasting of Future Pre-Credit Card Workload Requirements

The analysis of the past history of relevant data for the detection of observable and reasonably dependable regularities, and the projection of these regularities into the future, is a very widely used forecasting technique [Ref. 10]. In this section, this author will use the classical approach to time series analysis and break down (classical decomposition) the pattern into subpatterns. The long term trends and cyclical variation of both the pre-credit

card era and credit card era will be used to forecast future workload requirements. This author will not discuss the specifics of classical decomposition, such as determining centered moving averages and seasonalization of data, and will assume the reader has some understanding of regression techniques.

First, the pre-credit card era will be analyzed. Table 5 (see page 45) provides the raw data and forecasts future purchase order, BPA and Imprest Fund purchase actions done by the Supply Department. In Table 5, Y represents the raw data (actual purchase actions) from Column C of Table 3 (see page 34) for the period July 1993 through June 1995. The next column gives the centered moving averages. Y/MA is the result of dividing the raw data by the centered moving average numbers. S represents the seasonal index (S repeats itself every 5th iteration). Y/S represents the seasonally adjusted data. Finally, Y=T*S represents the forecasted purchase actions (average per quarter), which may be compared to the raw data (Y); those in bold are the forecasted values for 1996 and 1997. This is easier to visualize graphically; Figures 5 through 8 will aid in understanding the above.

Figure 5 is a plot of the raw data (Y) from Table 5. Figure 6 is a plot of the centered moving averages -- note how the spikes are smoothed. Figure 7 is a plot of the seasonalized data -- it is smoothed as well, and lays the foundation for the forecast provided in Figure 8. Note how closely the predicted and actual values compare. Although Figure 8 graphically represents 20 quarters, only 16 are shown in Table 5, as forecasting beyond 1997 would not be reliable based on the limited data.

As both the bold figures in Table 5 and the graph in Figure 8 illustrate, the data forecasts a steady decline in purchase order, BPA and Imprest Fund purchase actions done

by the Supply Department. However, at some point, which is extremely difficult to predict, the Supply Department's workload for micro purchases will stabilize.

Classical Decomposition - Predicted Buys Other Than From Credit Cards							
Year	Quarter	Y (Buys)	Mov. Avg.	Y/MA	S	Y/S	Y=T*S
1994	1	1503			1.161	1294.479	1135.4
	2	620			0.846	733.168	785.2
	3	750	812.25	0.9	0.923	812.250	811.8
	4	718	723.125	1.0	0.993	723.125	824.0
1995	5	819	705.375	1.2	1.161	705.375	906.3
	6	591	698.875	0.8	0.846	698.875	618.3
	7	637			0.923	689.871	629.6
	8	779			0.993	784.560	628.1
1996	9				1.161		**677.2**
	10				0.846		**451.5**
	11				0.923		**447.4**
	12				0.993		**432.1**
1997	13				1.161		**448.1**
	14				0.846		**284.6**
	15				0.923		**265.2**
	16				0.993		**236.2**

Table 5. Classical Decomposition Forecast for Pre-Credit Card Purchase Actions

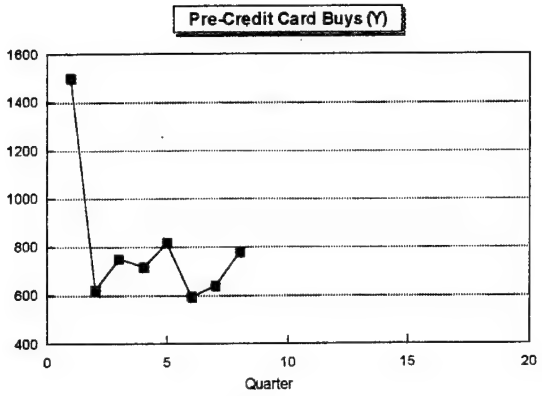

Figure 5

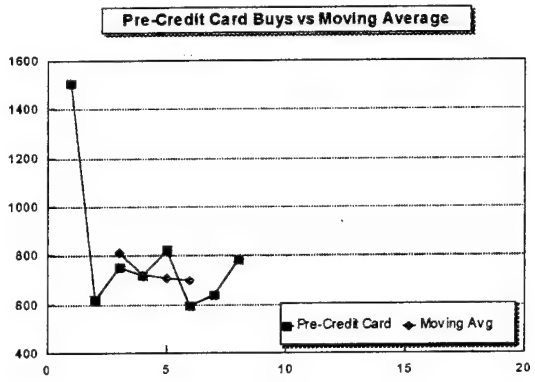

Figure 6

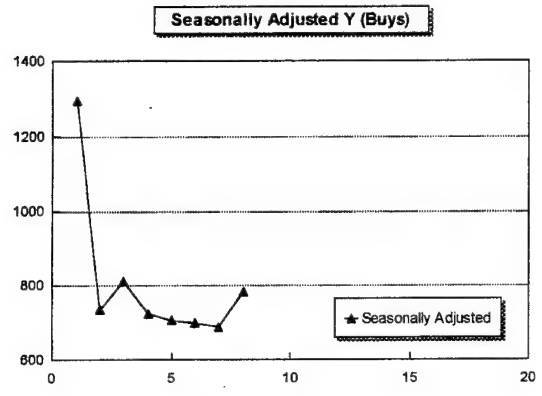

Figure 7

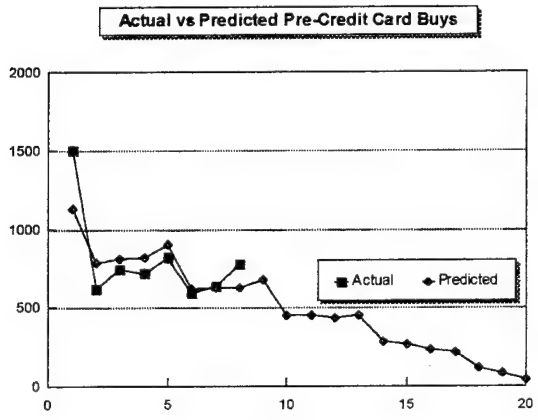

Figure 8

4. Forecasting of Future Credit Card Workload Requirements

Table 6 (see page 48) provides the raw data and forecasts future credit card purchase actions. In Table 6, Y represents the raw data (actual credit card purchase actions) from Column B of Table 3 (see page 34) for the period July 1993 through June 1995. The next column gives the centered moving averages. Y/MA is the result of dividing the raw data by the centered moving average numbers. S represents the seasonal index (S repeats itself every 5th iteration). Y/S represents the seasonally adjusted data. Finally, Y=T*S represents the forecasted credit card purchase actions (average per quarter), which may be compared to the raw data (Y); those in bold are the forecasted values for 1996 and 1997. This is easier to visualize graphically; Figures 9 through 12 will aid in understanding the above.

Figure 9 is a plot of the raw data (Y) from Table 6. Figure 10 is a plot of the centered moving averages -- note how the peaks and troughs are smoothed. Figure 11 is a plot of the seasonalized data -- it is smoothed as well, and lays the foundation for the forecast provided in Figure 12. Note how closely the predicted and actual values compare. Although Figure 12 graphically represents 20 quarters, only 16 are shown in Table 6, as forecasting beyond 1997 would not be reliable based on the limited data.

As both the bold figures in Table 6 and the graph in Figure 12 illustrate, the data forecasts a consistent increase in credit card purchase actions done by cardholders outside of the Supply Department. However, at some point, which is extremely difficult to predict, this increase in workload for micro purchases will stabilize.

Classical Decomposition - Predicted Credit Card Buys							
Year	Quarter	Y	Mov. Avg.	Y/MA	S	Y/S	Y=T*S
1994	1	938			1.251	749.666	1169.3
	2	960			0.814	1178.833	872.6
	3	1442	1359.875	1.060	1.060	1359.875	1281.4
	4	1498	1580.875	0.948	0.948	1580.875	1274.9
1995	5	2141	1711.125	1.251	1.251	1711.125	1854.8
	6	1525	1872.625	0.814	0.814	1872.625	1318.8
	7	1919			1.060	1809.709	1862.4
	8	2313			0.948	2440.964	1794.1
1996	9				1.251		**2540.3**
	10				0.814		**1764.9**
	11				1.060		**2443.4**
	12				0.948		**2313.2**
1997	13				1.251		**3225.9**
	14				0.814		**2211.1**
	15				1.060		**3024.4**
	16				0.948		**2832.4**

Table 6. Classical Decomposition Forecast for Credit Card Purchase Actions

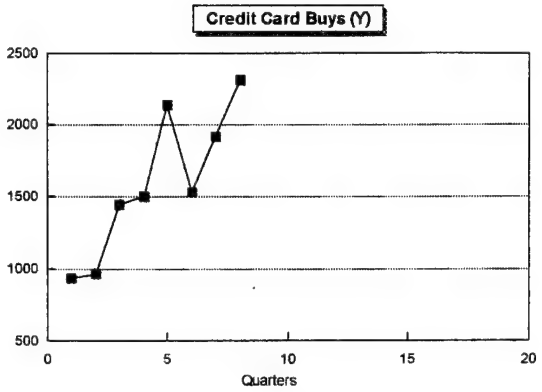

Figure 9

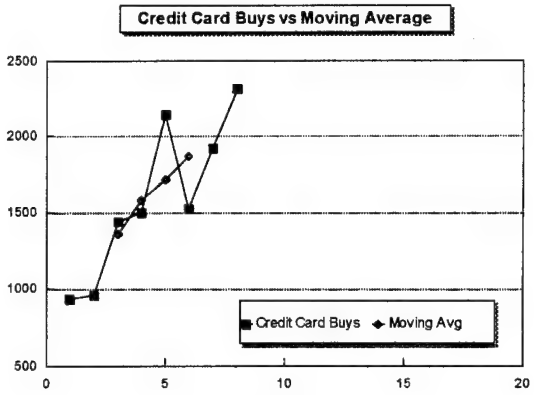

Figure 10

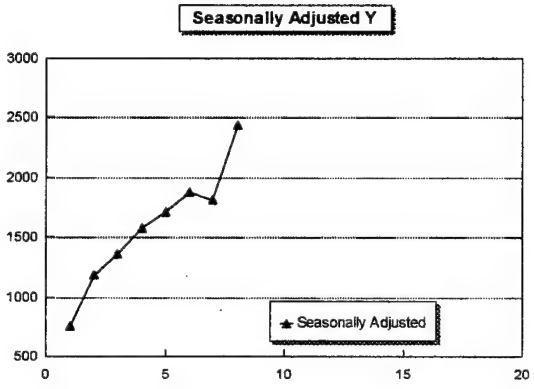

Figure 11

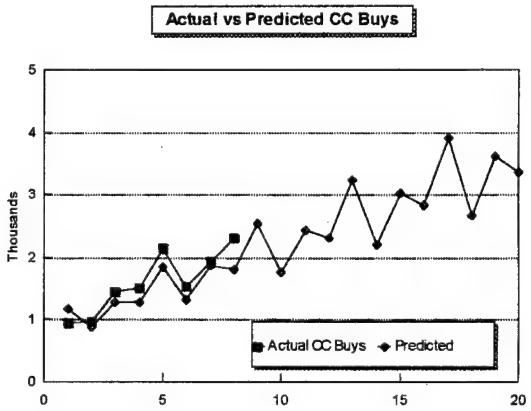

Figure 12

VI. CONCLUSION AND RECOMMENDATIONS

The purpose of this thesis was to analyze any impact on workload at the Naval Postgraduate School resulting from the use of government credit cards. Because workload requirements may have redistributed from the Supply Department to other departments, this study was conducted in an effort to measure and quantify any impact. The major conclusions and recommendations of this study are presented below.

A. CONCLUSION

1. The government credit card program at NPS, which was implemented in the Supply Department in April 1991 and officially implemented in the other departments beginning in October 1993, has changed the way micro purchases are made at NPS. Although purchase orders, BPAs and the Imprest Fund exceeded the use of the government credit card through September 1993, that changed dramatically when cardholders were designated over and beyond the 16 cardholders within the Supply Department.

2. The micro purchase volume for purchases made with the government credit card are almost double the volume for micro purchases made by the Supply Department. The change in micro purchase procurement methods has shifted workload requirements from the Supply Department to the 89 cardholders within other departments at NPS. Cardholders must now accomplish time consuming steps once the responsibility of the Supply Department -- technical screening, obligation of funds, procurement, receipt and document reconciliation.

3. Due to the Supply Department's micro purchase workload being nearly halved and credit card purchases now averaging almost 1,600 per quarter, personnel at NPS have found the government credit card to be the vehicle of choice for obtaining items less than $2,500.00. The credit card is not being used to circumvent the $2,500.00 per order purchase limitation.

4. Because the Supply Department's workload requirements for micro purchases have been nearly cut in half, personnel may be reassigned to other duties.

5. Based on regression models, the purchase action volume for the government credit card will continue to steadily increase and the purchase action volume for the Supply Department's micro purchases will continue to decline. Due to fiscal constraints, the credit card volume increase should taper off and level in the outyears. The Supply Department's micro purchase volume will not decline to zero; their expertise and services will always be required.

B. RECOMMENDATIONS

1. The Supply Officer, based on the workload reduction resulting from the use of government credit cards, should identify affected personnel and reassign them accordingly.

2. Since almost 95 percent of all purchase actions at NPS are for items less than $2,500.00, procurement agents in the Supply Department should again be trained in the use of the government credit card. It is easier to use, and is less costly to the government to administer.

Eighty-nine cardholders now exist at NPS for eleven departments; further expansion of the program should be carefully reviewed so as to maintain accountability and keep administrative costs within control.

3. Because workload requirements have shifted from the Supply Department to the cardholders in other departments, resourcing issues should be addressed. The majority of cardholders in the high volume departments, such as Systems Management, require full time dedication to micro procurement; others require only a modicum of additional effort per month, yet being a designated cardholder bears additional responsibility and time to already burdened personnel.

4. Because the potential exists for the government credit card to be used to circumvent the $2,500.00 per order limitation, the Supply Officer should initiate a program to monitor and prevent such abuse.

C. AREAS FOR FURTHER STUDY

Potentially productive areas for additional research arising out of this study include a number of topics. The following are areas recommended for future study:

1. Forecast when the credit card purchase action volume will level, based on future fiscal constraints.

2. Predict when the costs exceed the benefits of having cardholders outside of the Supply Department, i.e., when training and administrative costs begin to outweigh the advantages.

3. Determine the effects of raising the micro purchase limit for the government credit card and it effects.

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